State of California
The Resources Agency
Department of Water Resources
Northern District

ANGLING USE SURVEY OF FRENCHMAN LAKE, PLUMAS COUNTY, 1992

Technical Information Report No. ND-03-3

Prepared by

Ralph N. Hinton, Retired Annuitant

This report was prepared to summarize information collected under the Recreation Planning and Implementation Program to document fishing use in Frenchman Lake, Plumas County, following a chemical treatment in 1991. This report has received only limited review; it is intended for internal use and should be considered preliminary and subject to revision.

December 2003

TABLE OF CONTENTS

SUMMARY 1

INTRODUCTION 3

DESCRIPTION OF STUDY AREA 5

METHODS 7

Recreation Use Counts 7

Creel Census 7

RESULTS 9

Creel Census Data and Angler Success 9

Angling Use 9

DISCUSSION 13

Limitations of Use Counts and Creel Census 13

Rotenone Treatment and Lake Levels 13

ACKNOWLEDGMENTS 15

REFERENCES 16

FIGURES

1 Frenchman Lake, Plumas County 6

2 Length-Frequency of Censused Rainbow Trout, Frenchman Lake, 1992 10

3 Angler Origin by County Groups, Frenchman Lake, 1992 12

4 End of Month Storage at Frenchman Lake, 1991 and 1992 14

APPENDICES

I Recreation Survey Schedule for Frenchman Lake April 25, 1992 to November 15, 1992 17

II Frenchman Lake Fishery Data Collection Procedure 18

SUMMARY

An angler use survey of Frenchman Lake in Plumas County was conducted in 1992 to estimate fishing use and angler success, one year after the lake was chemically treated of the lake to remove illegally introduced northern pike. A similar study of general recreation use, including fishing, was conducted concurrently along Little Last Chance Creek, below Frenchman Dam (Elkins 1997).

A stratified random sampling procedure was used to sample shore and boat angler use at Frenchman Lake. Interviews of anglers (creel census) were used to gather information on angler success, fishing methods, and county of residence.

There were an estimated 133,000 hours of fishing at Frenchman Lake between April 25 and November 15, 1992. Although the lake is open to fishing year around, the majority of use occurs during the traditional Sierra stream trout season encompassed by these dates. Anglers caught an estimated 32,000 rainbow trout (*Oncorhynchus mykiss*) and 500 brown trout (*Salmo trutta*) (0.24 trout per hour) during this period. The mean fork length of angler-caught fish was 30.0 cm (11.8 in) for rainbow trout and 33.5 cm (13.2 in) for brown trout. Anglers also reported they caught, or caught and released an estimated 16,000 trout. About 77 percent of the anglers fished exclusively with bait, 10 percent with bait and lures, 7 percent with flies, and 6 percent with lures only.

Over 69 percent of the anglers at Frenchman Lake came from Nevada (mostly Reno/Sparks area), about 11 percent were from Sacramento County, 10 percent from the San Francisco Bay area, and 6 percent from the Northeast Counties (mostly Lassen County). The remaining 4 percent of anglers came from other widely scattered regions of California.

INTRODUCTION

Frenchman Dam was built by the Department of Water Resources in1961, as part of the State Water Project. Its purpose was to regulate Little Last Chance Creek for irrigation in Sierra Valley and to enhance local recreation opportunities (DWR 1957). At spillway elevation of 5,588 feet, the reservoir has a surface area of 1,580 acres, storage capacity of 55,500 acre-feet, and a maximum depth of about 100 feet. The downstream release was intended to maintain but not enhance the stream fishery. The reservoir is regulated primarily to supply downstream water rights and some water contracts.

In 1988, the Department of Fish and Game confirmed the presence of northern pike (*Esox lucius*) in Frenchman Lake (DFG 1990). Northern pike were illegally introduced into Frenchman Lake sometime previously, probably in the mid-1980s from lakes in eastern Nevada. Concern that they would eventually destroy the trout fishery and/or escape to other California waters prompted a chemical treatment of the lake by DFG in June 1991.

The sport fishery of Frenchman Lake was completely destroyed by the chemical treatment. Rotenone used for this treatment subsequently escaped to Little Last Chance Creek, thus also impacting the entire length of the creek and its fishery on June 12, 1991. When this treatment seemed successful in eradicating all fish from the lake, except for a few brown bullheads (*Ictalurus nebulosus*), the lake and creek were again planted with rainbow and brown trout of various sizes.

The 1992 angler survey was conducted to determine the amount of fishing use and quality of fishing one year after the chemical treatment, following restocking of the lake. Due to continuing drought conditions in the area, Frenchman Lake was still at an extremely low level in 1992 (approximately 9,000 to 15,000 acre-feet, about 16 to 27 percent of capacity and 31 to 44 percent of its normal water surface).

Using a stratified random sampling procedure, the survey combined roving use counts with creel census of anglers to gather information on the number of hours of fishing, fishing methods, angler success, and visitor origin. Estimates of angler use and catch were made for the period of April 25, 1992 to November 15, 1992 (the 1992 Sierra District stream trout-fishing season). Although Frenchman Lake is open to fishing year around and is popular some years for winter ice fishing, most of the fishing use occurs during the spring, summer, and fall periods because severe winter conditions and freezing of the lake surface limits access during the winter months.

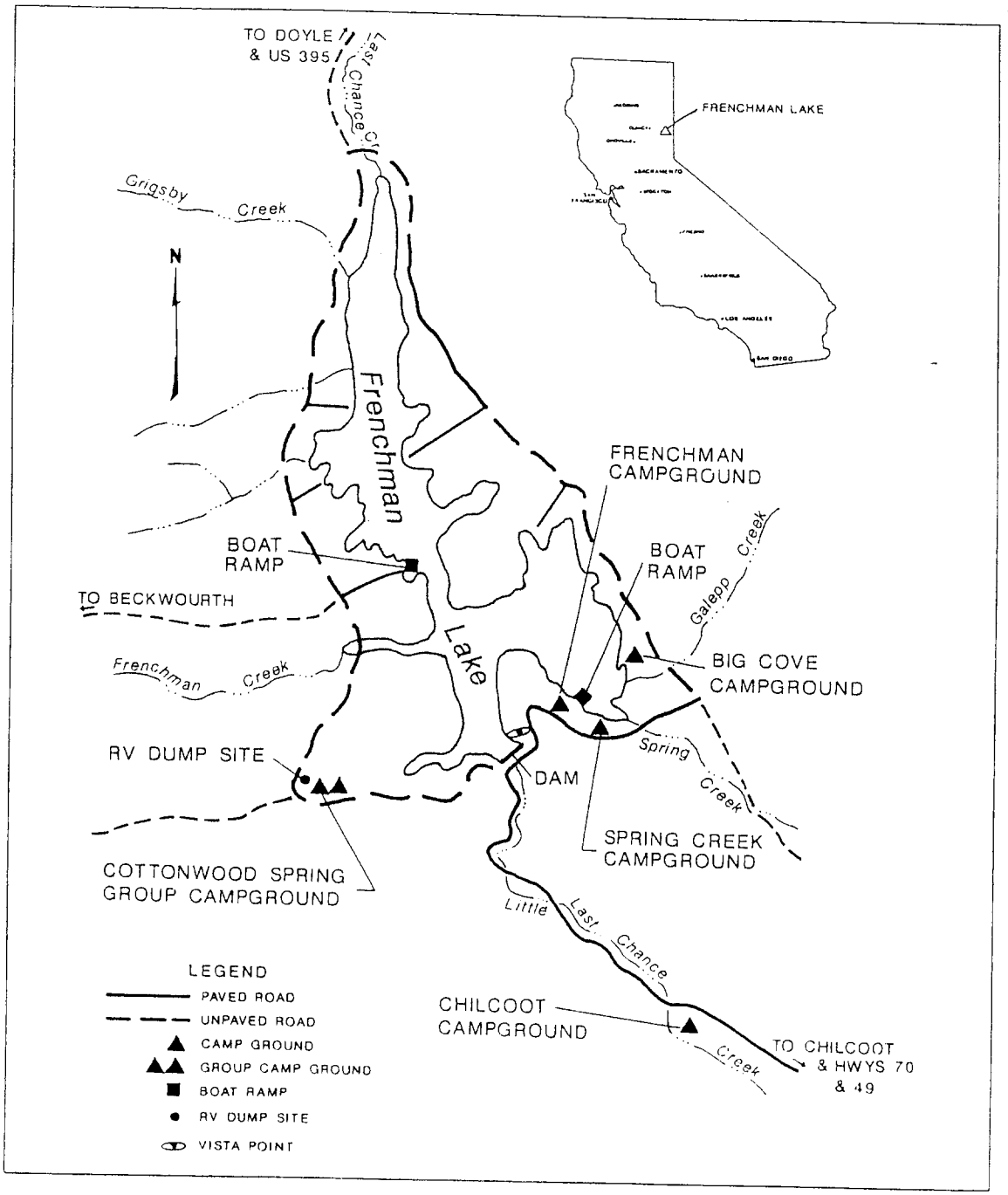
Separate reports describe the creel census data in detail (Hinton 2003), a recreation survey conducted concurrently on Little Last Chance Creek (Elkins 1997), and a fish population survey of Little Last Chance Creek conducted in October 1992 (Brown1993).

DESCRIPTION OF STUDY AREA

Frenchman Lake is located about eight miles north of the small town of Chilcoot in Plumas County, within the Plumas National Forest (Figure 1). Little Last Chance Creek, a tributary of the Middle Fork Feather River, feeds Frenchman Lake. Below Frenchman Dam, Little Last Chance Creek winds through a steep, lava-rock canyon for about four miles, and then flows through the sagebrush country of the northern Sierra Valley. Average annual runoff from the 81-square mile watershed upstream from the dam is about 28,000 acre-feet. The survey area included anglers along the shoreline near the dam and boat anglers using the greatly reduced lake surface.

As soon as the rotenone used in the 1991 treatment was no longer detectable, DFG planted Frenchman Lake with 35,500 catchable rainbow trout, 513 rainbow trout broodstock, and 1,700 catchable brown trout, plus 138,500 fingerling rainbow trout. In 1992 they planted an additional 20,500 catchable rainbow trout, 199,766 fingerling rainbow trout and 15,834 fingerling brown trout (Rischbieter 1998).

Figure 1. Frenchman Lake



Source of Map: DWR 1989

METHODS

Recreation Use Counts

Use counts were made on randomly selected dates within nine survey strata, using the optimum allocation method described by Abramson and Tolladay (1959). Twenty-eight days of the 205-day period from April 25 through November 15, 1992 (the Sierra District stream trout season) were surveyed. Three counts of shore anglers near the dam were made on each survey day in the morning, midday, and late afternoon, scheduled according to the number of daylight hours (Appendices I and II). At least one count of shore anglers using other areas of the lake was also made each survey day. Boat anglers were estimated by counting the number of boat trailers and cartop boat carriers at least twice each survey day, and counting the number of people per boat observed on the lake at least once each day.

The daily counts of shore anglers were totaled and multiplied by factors that accounted for angling use in the daylight periods not counted. The boat and cartop carrier counts were multiplied by the average number of people per boat and similarly expanded. The resulting daily figures were expanded to estimate total hours of fishing for all days in each stratum. Adding the stratum totals provided an estimate of hours of fishing for the study period.

Creel Census

Between use counts, anglers were censused along the shoreline and at the only operating boat ramp. Anglers at Frenchman Lake were contacted during nine of the 28 surveys days to determine fishing success. The county of residence, fishing methods, and length of time spent fishing so far that day (rounded to the nearest quarter-hour) were recorded for each angler contacted. Fish kept by anglers were counted, measured (fork length to nearest 0.5 centimeter), and identified to species. Information about fish that anglers reported catching, or catching and releasing, was recorded separately since this information is more speculative.

To determine total catch, the average catch per hour (derived from the creel census of fish observed) was multiplied by estimated total hours of fishing for each stratum. Unfortunately, creel census information was obtained on only nine days during five of the nine survey strata between April 25 and August 2, making the estimated total catch an approximation, at best.

RESULTS

Creel Census Data and Angler Success

During the survey period, 120 anglers were censused who had fished 336 hours with an observed catch of 132 rainbow trout and two brown trout (0.40 trout per hour). In addition, 75 rainbow trout were reported caught, or reported caught and released. About 77 percent of the anglers fished exclusively with bait, 10 percent with bait and lures, 7 percent with flies, and 6 percent with lures only.

Shore anglers totaled 105 anglers who had fished 270 hours and caught 93 rainbow trout (0.34 trout per hour). They reported catching, or catching and releasing, 31 additional trout. Boat anglers numbered 15 anglers who had fished 66 hours and caught 39 rainbow trout and two brown trout (0.62 trout per hour). They reported catching, or catching and releasing, 44 additional rainbow trout.

Mean fork length of 90 measured rainbow trout (Figure 2) was 30.0 cm (11.8 in.) and the two brown trout measured 34.5 and 32.5 cm (13.6 and 12.8 in.). The largest rainbow trout measured 43.0 cm (16.9 in.).

Angling Use

Total angling use on Frenchman Lake was estimated at 133,000 hours (±18,000 hours) for the period April 25 to November 15, 1992. Based on the hours of fishing reported by 44 anglers who had completed fishing for the day, this represents about 40,000 angler-days. They caught an estimated 32,000 rainbow trout and 500 brown trout (0.24 trout per hour).

Based on the number of fish that anglers reported catching, or reported catching and releasing, as many as 16,000 additional trout may have been caught and/or caught and

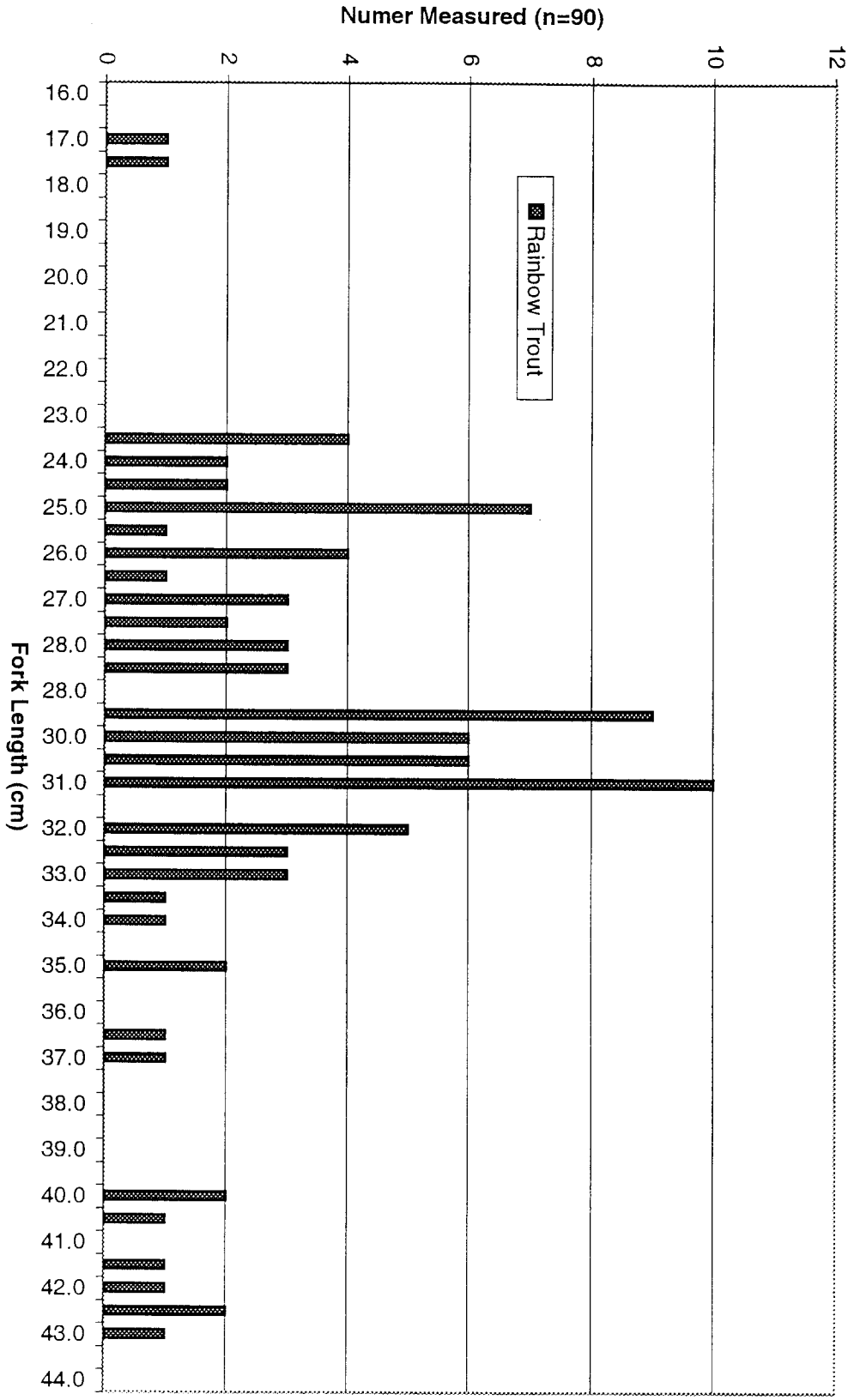


Figure 2
Length-Frequency of Rainbow Trout
Frenchman Lake - 1992

released. Including all trout caught, reported caught, or reported caught and released, angler success was 0.36 trout per hour. It must be emphasized that because creel census data was not obtained for all nine survey strata when anglers were observed and counted, these estimates of trout caught should be considered at best only approximate numbers. They may under-estimate the actual catch.

The estimated catch of 32,000 rainbow trout represents over half of the catchable-sized and broodstock rainbows planted in Frenchman lake during 1991 and 1992. The estimated catch of 500 brown trout is nearly 30 percent of the catchable-sized browns planted in 1991. In addition, survivors of the 138,500 fingerling rainbow trout planted in 1991 would have been large enough to catch in 1992. The two smallest trout censused (Figure 2) are likely from this group. Many of the estimated 16,000 trout anglers reported catching and releasing also may have been from this group of fish.

Over 69 percent of the anglers contacted at Frenchman Lake in 1992 reported that they lived outside California (mostly the Reno/Sparks area of Nevada). About 11 percent were from Sacramento County, 10 percent from the San Francisco Bay area, and 6 percent from the Northeast Counties (mostly Lassen County). The remaining four percent were from counties widely scattered among other regions of California (Figure 3).

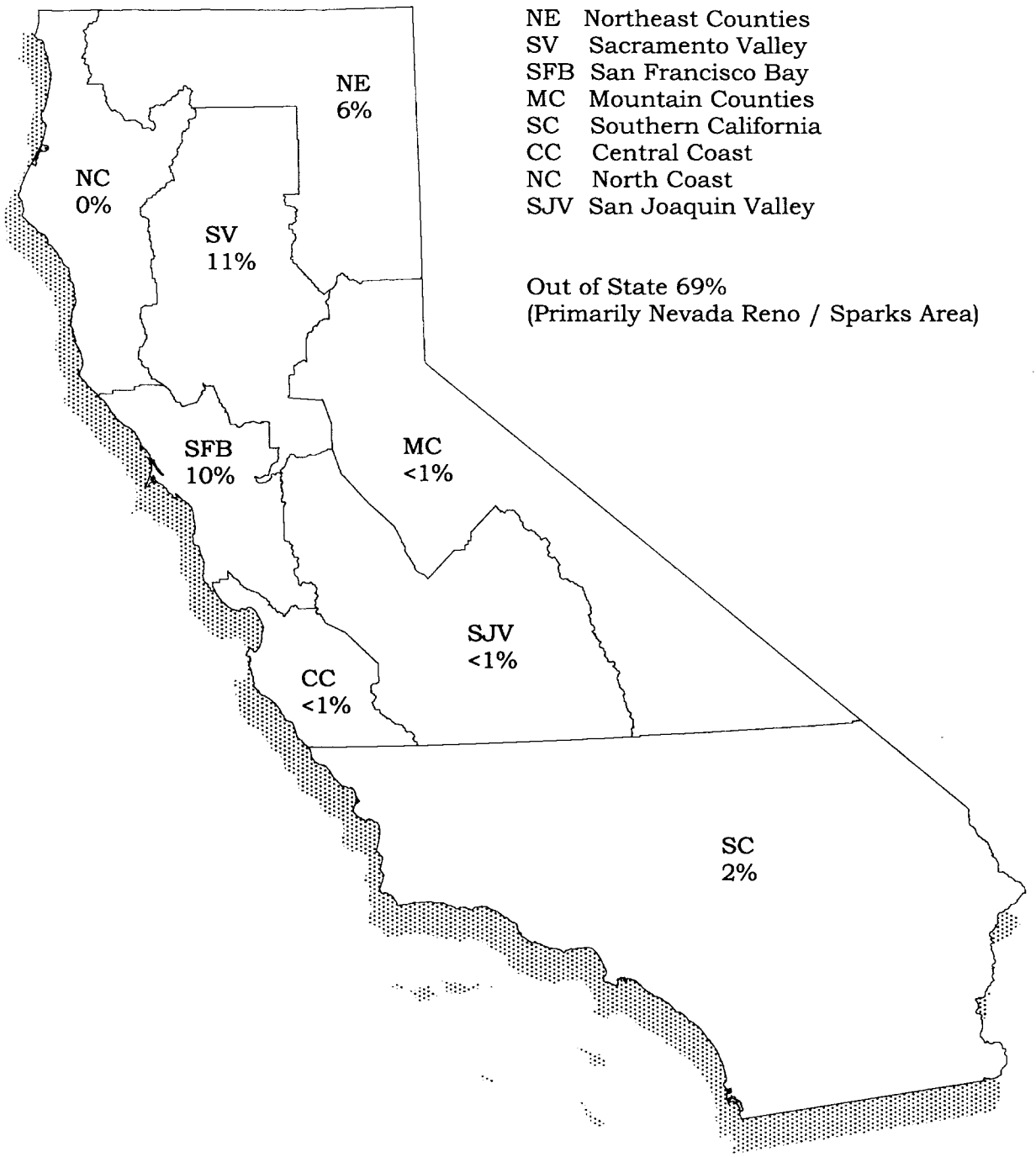


Figure 3 - Frenchman Lake - Angler Origin by County Groups - 1992

DISCUSSION

Understanding the limitations of the recreation use survey and the creel census helps put the data obtained in the proper perspective. This section describes the survey limitations, the 1991 rotenone treatment, and a persistent drought that affected angling use of the lake.

Limitations of Use Counts and Creel Census

Most anglers using the lake were easily observed during the use counts. Some people may have been temporarily out of sight during use count periods, perhaps inside motorhomes, restrooms, or other locations not visible to the surveyor. Generally, anglers along the shoreline on either side of the dam were visible from the dam and anglers along other portions of the lake could be seen from other vantage points. Boat anglers were not always visible, but their parked vehicles could be easily counted.

The most serious limitation of this survey was the creel census that reached only 0.25 percent of the estimated hours of fishing. In addition to this low percentage, census data was obtained for only five of the nine survey strata, so the resulting estimates of total catch must be used with considerable caution.

Rotenone Treatment and Lake Levels

Frenchman Lake spilled in the winter and spring of 1986 and then began a long, slow decline due to persistent drought during the late 1980s and early 1990s. Storage reached a low near 8,800 acre-feet in fall 1992, following the rotenone treatment the previous summer (Figure 4). Then the lake began to refill in 1993 and finally spilled again in spring 1995.

The low water levels during 1991 made it relatively easy to chemically treat the reservoir, although consideration was given to releasing water to make it lower, or even draining it entirely. All of Frenchman Lake and Little Last Chance Creek one-half to

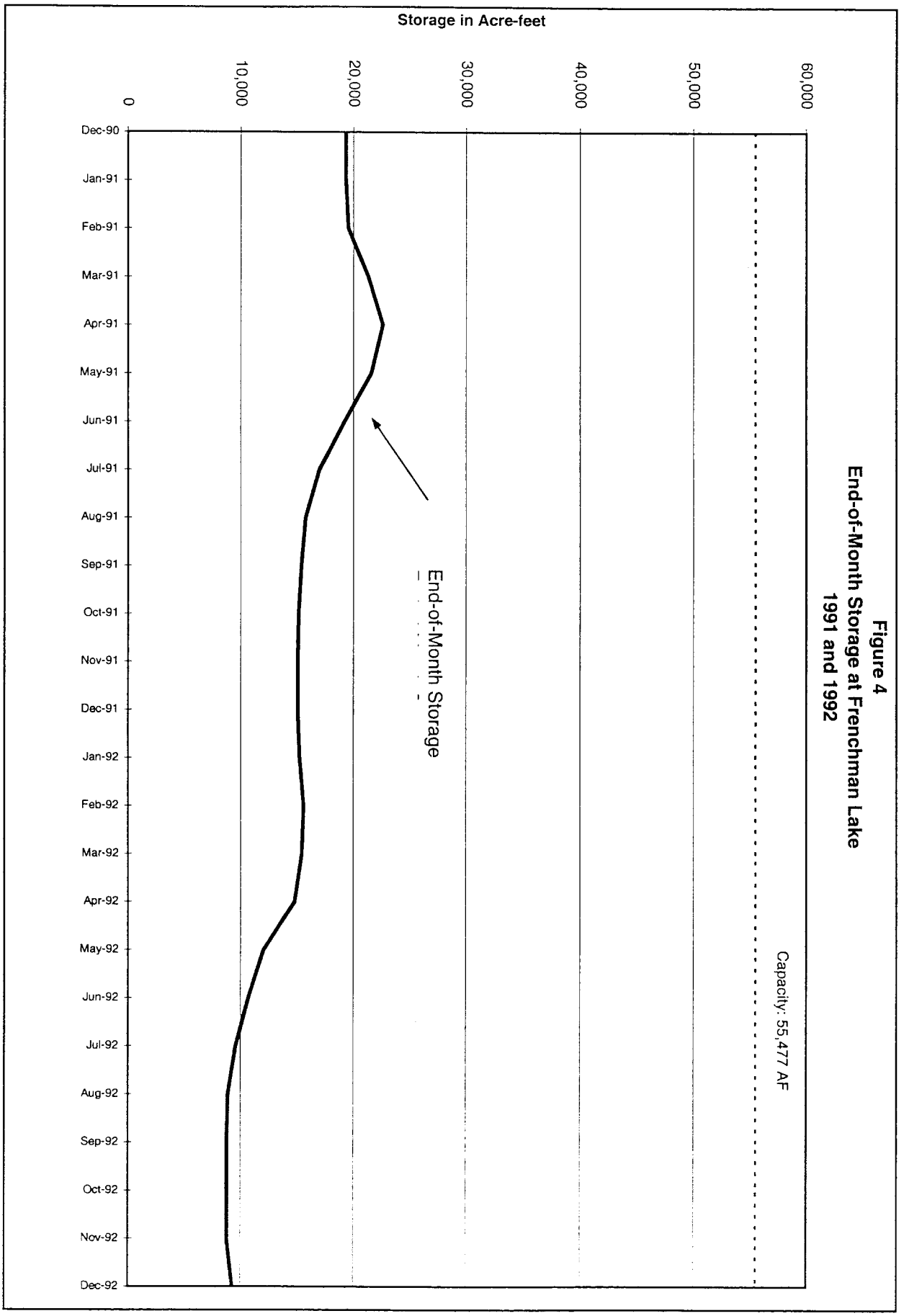


Figure 4
End-of-Month Storage at Frenchman Lake
1991 and 1992

one mile upstream of the lake were treated with a liquid form of synergized rotenone. The release from Frenchman Dam was treated with potassium permanganate in an effort to neutralize the rotenone. However, the detoxification was unsuccessful and all fish were killed for several miles below Frenchman Dam.

All the recreation areas and access to Frenchman Lake were closed for about a month after the chemical treatment to allow the lake and stream to detoxify naturally. The reservoir was restocked with fish and the recreation areas opened to public use when they were deemed safe by public health officials.

The low water levels for nearly two years following the chemical treatment made fishing and other recreation activities at the lake difficult. Anglers were generally restricted to areas relatively near the dam and boat access was limited to one boat ramp that was unsuitable for large boats.

ACKNOWLEDGMENTS

Environmental Specialist Douglas Rischbieter, Student Assistant Julie Brown, and Volunteer Student Assistant/Intern Grant Blinn collected the use counts and creel census information on for this survey. Mike Serna and Jake Nicholas prepared the figures and Northern District Secretary Lori Miles finalized the text and tables.

REFERENCES

Abramson, Norman and Joyce Tolladay. 1959. "The Use of Probability Sampling for Estimating Annual Number of Angler days". California Department of Fish and Game. 45(4):303-311.

Brown, Charlie. "Standing Stocks of Fishes in Sections of Little Last Chance Creek, Plumas County, 1992". 1993. California Department of Fish and Game. 17 pp.

Brown, Julie. 1989. "Recreation Use Survey of Little Last Chance Creek, Plumas County,1988". Northern District Technical Information Report No. 89-1. Department of Water Resources. 20 pp.

Department of Fish and Game. 1990. "Northern Pike Eradication Project." Draft Environmental Impact Report. 270 pp.

_____. 1991. "Northern Pike Eradication Project." Draft Subsequent Environmental Impact Report. 174 pp.

Department of Water Resources. 1957. "Investigation of Upper Feather River Basin Development". Bulletin No. 59. (Interim Report on Engineering, Economic, and Financial Feasibility of Initial Units). 135 pp. plus Appendixes A-D.

_____. 1974. "Survey of Recreation Potentials, Upper Feather River Basin". Central District Report. 42 pp. plus Appendix A.

_____. 1989. "Recreation Facilities of the State Water Project: An Inventory". Central District Report. 62 pp.

Elkins, David. 1997. "Recreation Use Survey of Little Last Chance Creek, Plumas County, 1992". Northern District Technical Information Report No. 97-2. Department of Water Resources. 23 pp.

Hinton, Ralph N. 2003. "For Your Files: 1992 Frenchman Lake Creel Census". Memorandum to Kathy Hill, Fisheries Management District Supervisor, Department of Fish and Game dated November 21, 2003. 4 pp.

Rischbieter, Douglas. 1998. "Contribution of Frenchman Lake Spill to the Fishery of Little Last Chance Creek". Department of Water Resources, Northern District. 52 pp. plus appendices.

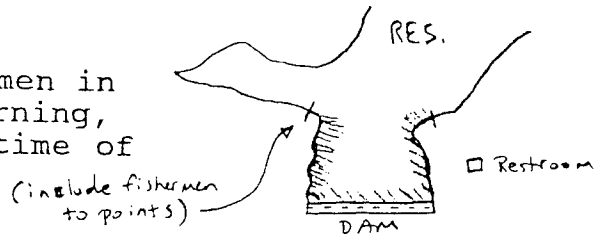
Appendix I

Recreation Survey Schedule for Frenchman Lake
April 25, 1992 to November 15, 1992

Date	Holiday Period (HD) Normal Weekend (WE) Normal Weekday (ED)	Survey Stratum
April 25	WE	I
April 26	WE	I
April 30	WD	IV
May 5	WD	IV
May 23	HD	II
May 24	HD	II
May 29	WD	IV
May 30	WE	III
May 31	WE	III
June 5	WD	IV
June 13	WE	III
June 16	WD	IV
June 21	WE	III
June 25	WD	IV
July 4	HD	IX
July 13	WD	VI
July 14	WD	VI
July 25	WE	V
July 26	WE	V
July 27	WD	VI
August 2	WE	V
August 10	WD	VI
August 14	WD	VI
September 6	HD	IX
September 11	WD	VIII
October 3	WE	VII
October 4	WE	VII
October 16	WD	VIII

Appendix II

Frenchman Lake Fishery Data Collection Procedure



1. Record the number of shore fishermen in the dam area (see figure) in the morning, midday, and late afternoon. Record time of observation.

2. In conjunction with at least one of the above counts, count the rest of the shore fishermen around the lake. You should be able to see everyone by using binoculars and driving between Lunker Point and the Frenchman boat ramp (short way).

3. Record the number and type of boat carriers (cartop, trailers) at the Frenchman boat ramp once in the morning and once in the afternoon. Record time.

4. Census and interview boat anglers as they come in to the ramp. Mid-morning through lunch time is probably the period of day when most people come ashore.

5. Census and interview shore anglers as time permits.

6. Once each day, tally the frequency of boats on the water by discrete numbers of occupants (number of boats with 1 person, number with 2, etc.). Since all we want to do is get an average figure (persons per boat), it's not necessary to see every boat on the lake to do this.

DATE: _____ **STRATUM:** _____

TIME	DAM ANGLERS		OTHER ANGLERS*

*Only one count necessary

TIME	BOAT TRAILERS		CARTOP CARRIERS

Number of People per Boat Observations				
TIME	1 person	2 people	3 people	4 people